

N° 7163



A.D. 1910

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Complete Specification Left, 15th Sept., 1910—Accepted, 12th Jan., 1911

PROVISIONAL SPECIFICATION.

Improvements in Safety Valves.

I, DAVID GUTHRIE, of 83, Milkwood Road, Herne Hill, in the County of Surrey, Heating Engineer, do hereby declare the nature of this invention to be as follows:—

The invention relates to improvements in that class of safety valves which is fitted on heating apparatus which operate by means of the circulation of hot water: its object being to enable repairs, alterations or renewal of wearing parts to be effected without the necessity of draining the system.

The valve is by preference fitted on the flow pipe as near to the boiler as practicable and consists of a central body the passage through which is of ample area to correspond to the size of the discharge desired, the periphery of the body being screwed to fit the connection to which it is to be attached. Below and at the end or tail of the body is screwed a perforated cap or cage of smaller diameter to clear the peripheral thread, into which is fitted a valve disc and spindle moving in a socket-guide and controlled by a spring, the disc forming a valve with a seating prepared on the tail of the body. On the centre of the disc is formed a slight conical recess into which the end of a spindle carrying the main valve engages and this spindle is swelled to correspond with and form the main valve with the seating prepared on the upper end of the said central body, the external wall of which is produced and screwed to engage with a domed cover the wall being perforated between the valve seating and the lower side of the screw.

The spindle is prolonged through the domed cover and terminates in a conical point upon which rests, within a sleeve having a corresponding conical bottom, a disc or circular plate with elongated central stud for the reception of the usual safety weights.

The domed cover is screwed hard down to and shouldered on the central body sufficient space being left at its lowest edge for the escape of water when the pressure or temperature exceeds what has been arranged for by the safety weights. On the spindle above the main valve there is another swelling by means of which, coming in contact with the underside of the dome, the stroke can be adjusted and properly determined in such a manner that the under valve cannot come into play or in any way affect the areas of passage but on the removal of the dome shall at once operate and prevent any escape of water during the period of alteration or repair.

A cup or other means of catching escaped water may be arranged to prevent damage to the boiler structure.

Dated this 22nd day of March, 1910.

DAVID GUTHRIE.

[Price 8d.]



Guthrie's Improvements in Safety Valves.

COMPLETE SPECIFICATION.

Improvements in Safety Valves.

I, DAVID GUTHRIE, of 83, Milkwood Road, Herne Hill, in the County of Surrey, Heating Engineer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improvements in that class of safety valves which is fitted on heating apparatus, operating by means of the circulation of hot water, its object being to construct the safety valve with an emergency valve to be operated when required to enable repairs, alterations, or renewal of the wearing parts connected with the safety valve proper (hereinafter called the main valve) to be effected without the necessity of draining the water out of the system of pipes and boiler.

It is well known that safety valves with metal valves and seatings become leaky, while those fitted with discs or seatings of rubber or composition are inclined to stick so that they fail to operate when required. Each type of safety valve requires the system to be emptied of water before it can be repaired. To obviate this difficulty and to make a reliable safety valve, I combine the advantages of each type by making the main valve of metal resting on a metal seating so as to be "non-sticking" and the emergency valve with a disc of fibre, rubber or composition which shall be "non-leaking".

I am aware that a separate auxiliary or secondary valve has been designed to be used in conjunction with safety valves for hot water heating apparatus, the auxiliary valve being held open normally and can only be shut gradually by unscrewing the safety valve, whereas my invention provides, by partially unscrewing the cover and then removing the weights, for the instantaneous shutting of the emergency valve, so minimising the leakage of water and consequent danger of scalding the operator, and permitting the parts of the main valve to be removed at leisure. It also allows the emergency valve with its spring to be tested by simply removing one or more weights, when the spring will, if in proper order, raise the emergency and main valves to the extent arranged for by previous adjustment. The separate auxiliary valve is an adjunct to the safety valve, and may be used with any suitable make of safety valve, but in my invention the emergency valve is an essential part of the construction which is only intended to be used as a whole.

In my invention the safety valve may be fixed direct on the boiler, but is by preference fitted on the flow pipe as near to the boiler as practicable and consists of a central body, the passage through which is of ample area to correspond to the size of the discharge desired, the periphery of the body being screwed to fit the connection to which it is to be attached. The body is made in two parts screwed together so that the upper part carrying the seating of the main valve may be easily disconnected for repairs without disturbing the lower part which is screwed into the boiler or into the flow pipe. Below and at the end of the body is screwed a perforated cap or cage, of smaller diameter to clear the peripheral thread, into which cap is fitted a valve-disc and spindle moving in a socket-guide and controlled by a spring, the disc forming the emergency valve with a seating prepared on the tail of the body. On the centre of the disc is formed a slight conical recess into which, the end of a spindle carrying the main valve, engages, and this spindle is swelled to correspond with, and form the main valve with the seating prepared on the upper end of the said central body, the external wall of which is produced and screwed to engage with a domed cover, the wall being perforated between the valve seating, and

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- the lower side of the screw. The spindle is prolonged through the domed cover and terminates in a conical point upon which rests, within a sleeve and having a corresponding conical bottom, a disc or circular plate with elongated central stud for the reception of the safety weights, which shall be sufficient to
5. counterbalance the pressure due to the head of water in the system and also to force the emergency valve from its seating against the pressure of the spring. It will be readily understood that the main and emergency valves are differentially loaded, the weights on the main valve forming the superior loading, and the spring on emergency valve forming the inferior loading.
- 10 The domed cover is screwed hard down to and shouldered on the central body, sufficient space being left at the lowest edge for the escape of water when the pressure or temperature exceeds what has been arranged for by the safety weights. On the spindle above the main valve there is another swelling by means of which, coming in contact with the underside of the dome, the stroke
- 15 or lift of the main valve can be adjusted so that the emergency valve cannot come into play or in any way affect the area of passage, but shall, on the removal of the domed cover, or removal of the weights after partially unscrewing the domed cover, at once operate and prevent any escape of water during the period of alteration and repair. A dish is fitted between the two parts of the central
- 20 body for catching the waste water which is carried off in a suitable draining pipe.

In order that my invention may be well understood I have appended hereto a sheet of drawings in which,

- 25 Figure 1 is an elevation of the improved safety valve fixed to a branch on the flow pipe from a hot water boiler.

Figure 2 is a sectional elevation of the improved safety valve to a larger scale than Figure 1.

- Figure 3 is a plan, to the same scale as Figure 2, of the central body showing the external wall produced and the perforations through which the escaping
- 30 water passes.

- In the drawings "a" and "a'" are the two parts of the central body "a", carrying the seating on which rests the main valve, and "a'" being screwed into a branch from the flow pipe and carrying the perforated cap "b" and seating of the emergency valve. "a²" are the perforations in the body "a" through which the escaping water passes. "b'" is the socket-guide for the spindle "c'" of the emergency valve "c" and "d" is the controlling spring normally held in compression by the weighted main valve "e" through the extended spindle "e'". "e²" is the spindle above the main valve prolonged through the domed cover "f" which is screwed to the upper part "a" of the
- 40 central body. "f'" is a sleeve formed on "f" in which is placed, resting on the spindle "e²", the disc "g" with central stud "g'" on which are threaded the safety weights "h". "i" is the dish for catching the waste water, "i'" the draining pipe, "k" the flow pipe from the boiler, and "k'" the branch to which the safety valve is fixed.

- 45 Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. In improved safety valves for hot water heating apparatus, a main valve and an emergency valve differentially-loaded, the main valve superiorly loaded
- 50 by weights holding open the emergency valve against the pressure of a spring tending to close it, and the emergency valve inferiorly loaded by a spring closing it instantaneously when the superior loading is removed, substantially as and for the purposes herein specified.

2. In improved safety valves for hot water heating apparatus, the combination
- 55 of a superiorly loaded "non-sticking" main valve of metal resting on a metal seating, with an inferiorly loaded "non-leaking" emergency valve having a

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disc of fibre, rubber or composition resting on a metal seating and a spring normally held in compression by the superior loading of the main valve and shutting the emergency valve instantaneously when the superior loading is removed substantially as and for the purpose herein specified and as illustrated by the drawings.

3. The improved safety valve for hot water heating apparatus, comprising a central body in two parts, a superiorly loaded "non-sticking" main valve, and inferiorly loaded "non-leaking" emergency valve, a perforated cap, a domed cover disc plate, weights, spring and dish; constructed and operating as and for the purposes substantially as herein specified and as illustrated by the 10 accompanying drawings.

Dated the Fifteenth day of September, 1910.

DAVID GUTHRIE.

Redhill: Printed for His Majesty's Stationary Office, by Love & Malcomson, Ltd.—1911.

[This Drawing is a reproduction of the Original on a reduced scale]

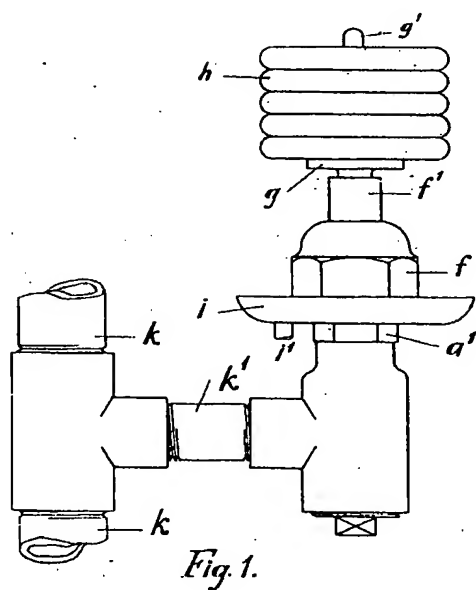


Fig. 1.

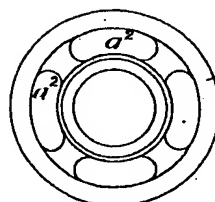


Fig. 3.

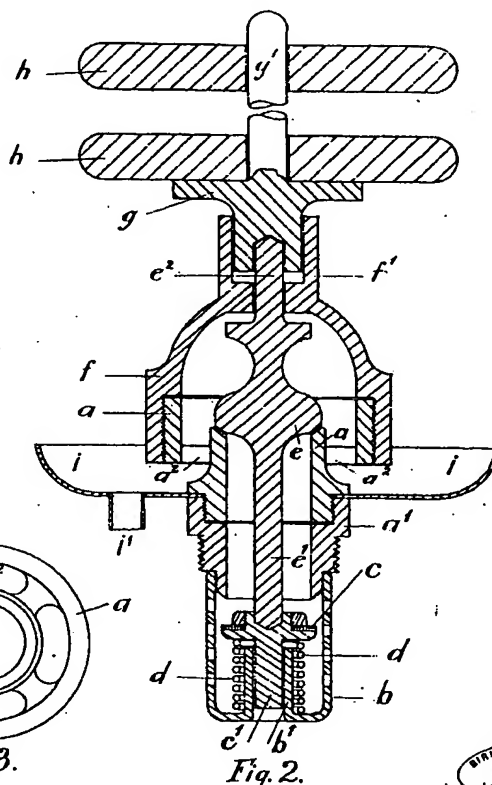


Fig. 2.



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[This Drawing is a reproduction of the Original on a reduced scale.]

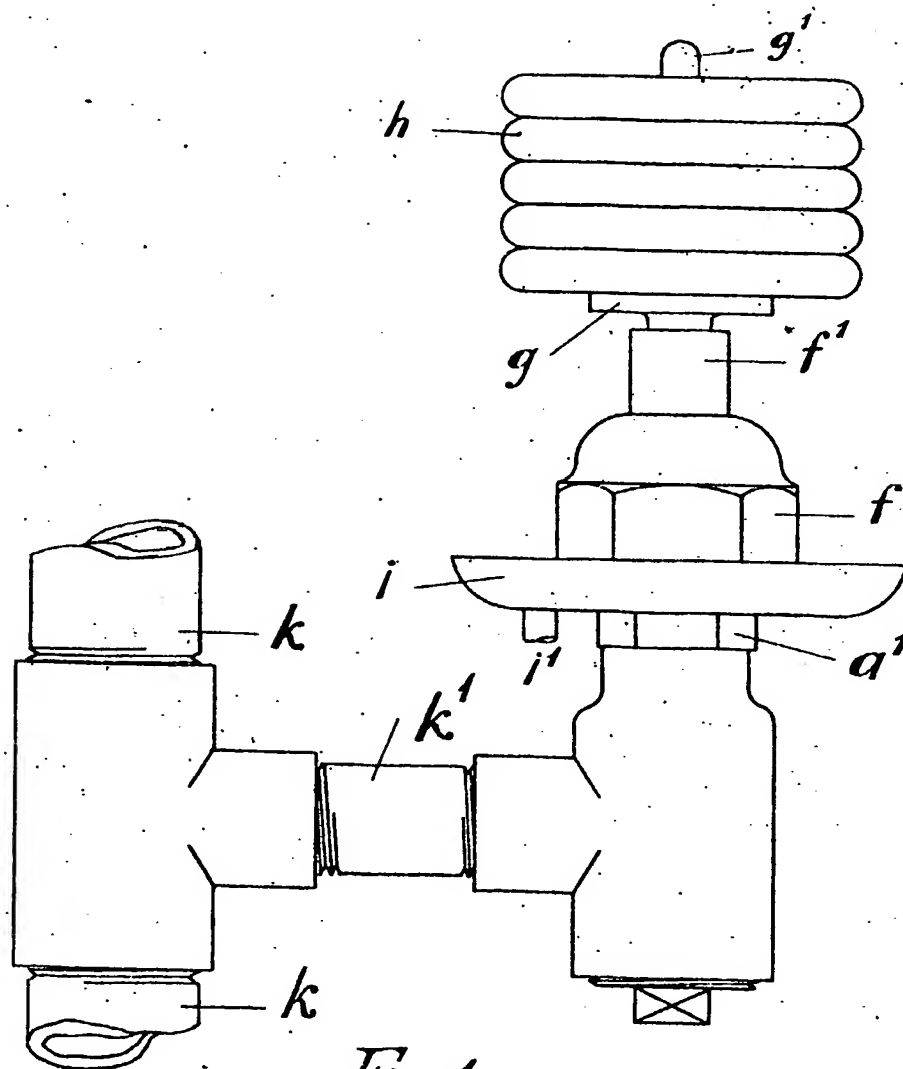
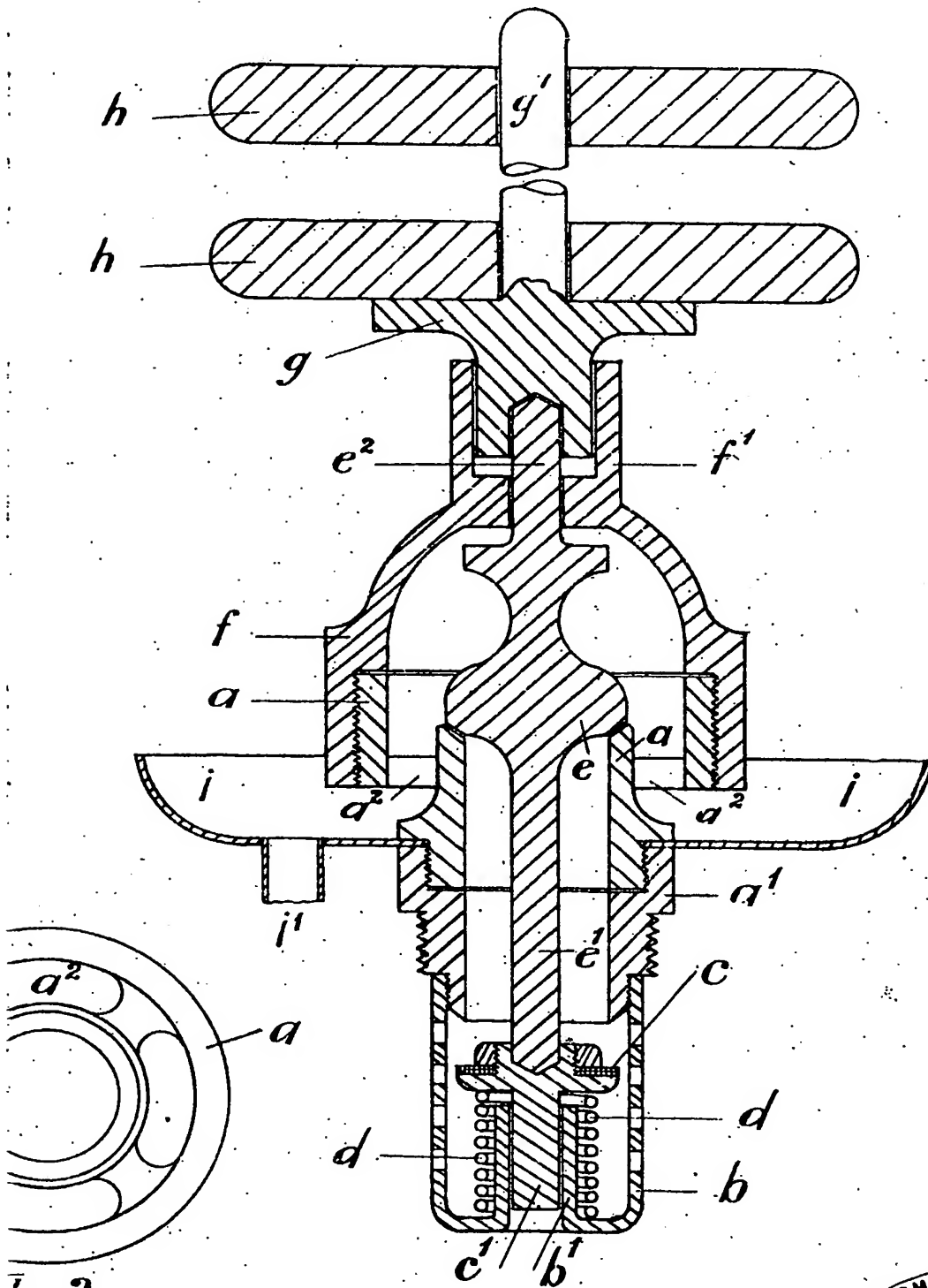


Fig. 1.





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